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NOTICE OF ALLOWANCE AND FEE(S) DUE

26285

7590

10/28/2010

K&L GATES LLP
210 SIXTH AVENUE
PITTSBURGH, PA 15222-2613

EXAMINER

BERNSITTEYN, MICHAEL

ART UNIT

PAPER NUMBER

1762

DATE MAILED: 10/28/2010

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,426	06/13/2007	Krzysztof Matyjaszewski	050096PCT/US	3039
TITLE OF INVENTION: ATOM TRANSFER RADICAL POLYMERIZATION PROCESS				

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$755	\$300	\$0	\$1055	01/28/2011

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
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P.O. Box 1450
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

26285 7590 10/28/2010

K&L GATES LLP
210 SIXTH AVENUE
PITTSBURGH, PA 15222-2613

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

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nonprovisional	YES	\$755	\$300	\$0	\$1055	01/28/2011

EXAMINER	ART UNIT	CLASS-SUBCLASS
BERNSHTEYN, MICHAEL	1762	526-111000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB-112) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB-47; Rev 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY AND STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 309 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 309 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability**Application No.**

10/591,426

Applicant(s)

MATYJASZEWSKI ET AL.

Examiner

MICHAEL M. BERNSTEYN

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 09/16/2010.
2. ☒ The allowed claim(s) is/are 1,2,5-38,52 and 57-61.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date 09/16/2010
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Michael M. Bernshteyn/
Examiner, Art Unit 1762

DETAILED ACTION

1. This Office Action follows a response filed on September 16, 2010. No claims have been amended; claims have been added; no claims have been cancelled.
2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on September 16, 2010 has been entered.
3. Claims 1, 2, 5-38, 52 and 57-61 are pending.

Allowable Subject Matter

4. Claims 1, 2, 5-38, 52 and 57-61 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: the present claims are allowable over the closest references: Matyjaszewski et al. (EP 1 555 273 A1), Matyjaszewski et al. (U.S. Patent 6,162,882), Matyjaszewski et al. (U. S Patent Application Publication 2002/0128405), and Matyjaszewski et al. (U.S. Patent 5,807,937).

Matyjaszewski'273 discloses improved processes for atom (or group) transfer radical polymerization (ATRP), which involve polymerizing in the presence of a (partially) free radical- deactivating amount of the corresponding reduces or oxidized

transition metal compound. In a further improvement the ATRP process involves polymerizing in homogeneous system in the presence of a solubilized initiating/catalytic system (abstract).

Matyjaszewski'273 discloses a polymerization process comprising the process steps: polymerizing one or more radically polymerizable monomers in the presence of initiating system comprising: an initiator having a radically transferable atom or group, a transition metal compound which participates in a reversible redox cycle (i.e., with the initiator), an amount of the redox conjugate of the transition metal compound sufficient to deactivate at least some initially-formed radicals, and any N-, O-, P- or S- containing ligand which coordinates in a o-bond or any carbon-containing ligand which coordinates in a rr-bond to the transition metal, or any carbon-containing bond with said monomer under the polymerizing conditions, to form a (co)polymer, and isolating the formed (co)polymer; and, in part, by novel (co)polymers prepared by atom (or group) radical transfer polymerization 1 (pages 5-6, [0042]).

The molar proportion of transition metal compound relative to initiator is generally that which is effective to polymerize the selected monomer(s), but may be from 0.0001:1 to 10:1, preferably from 0.1:1 to 5:1, more preferably from 0.3:1 to 2:1, and most preferably from 0.9:1 to 1.1:1. Conducting the polymerization in a homogeneous system may permit reducing the concentration of transition metal and ligand such that the molar proportion of transition metal compound to initiator is as low as 0.0001:1, which is clearly within the claimed ranges as per claims 1,5-7, and 52 (page 16, [0110])

Matyjaszewski'882 discloses a process of atom (or group) transfer radical polymerization for the synthesis of novel homopolymer or a block or graft copolymer, optionally containing at least one polar group, with well defined molecular architecture and narrow polydispersity index, in the presence of an initiating system comprising (i) an initiator having a radically transferable atom or group, (ii) a transition metal compound, and (iii) a ligand,

Matyjaszewski'882 discloses the synthesis of a macromolecule having at least two halogen groups which can be used as a macroinitiator component (i) to subsequently form a block or graft copolymer by an atom or group transfer radical polymerization process, and a process of atom or group transfer radical polymerization for the synthesis of a branched or hyperbranched polymer (abstract). Another object is to provide a novel method for the synthesis of a macroinitiator for "living" radical polymerization and for the synthesis of a well defined block or graft copolymer where the macroinitiator constitutes at least one segment of the block copolymer (col. 5, lines 51-56). Accordingly, there is provided a method for atom (or group) transfer radical polymerization, encompassing the polymerization of a vinyl monomer in the presence of an initiating system, which includes: an initiator having a radically transferable atom or group, a transition metal compound, and a ligand; the polymerization forms a macroinitiator of formula (I):



wherein each X is a halogen atom and n is an integer of 1 to 100; this macromonomer is then used in the presence of a vinyl monomer, a transition metal

compound, and a ligand to form a block or graft copolymer, exhibiting a well defined molecular architecture (col. 6, lines 12-25).

Matyjaszewski'882 discloses that the molar ratio of the components (i), (ii) and (iii) of the initiating system may range from 1/0.01/0.02 to 1/4/12 (col. 12, lines 49-51)

When a solvent is used, suitable solvents include ethers, cyclic ethers, alkyl esters, aryl esters, C₁–C₁₀ alkanes, C₅–C₈ cycloalkanes which may be substituted with from 1 to 3 C₁–C₄ alkyl groups, aromatic hydrocarbon solvents, halogenated hydrocarbon solvents, acetonitrile, dimethylformamide, mixtures of such solvents, and supercritical solvents (such as CO₂, C₁–C₄ alkanes in which any H may be replaced with F, etc.). The present polymerization may also be conducted in accordance with known suspension, emulsion and precipitation polymerization processes (col. 13, lines 1-12; col. 13, line 32 through col. 17, line 67).

The method for making a hyperbranched molecule is illustrated in scheme 5. the activation-deactivation process is shown in the first step and is assumed to occur throughout the polymerization. Activation occurs prior to addition of a monomer unit and deactivation after monomer addition (col. 20, line 30 through col. 21, line 57).

Matyjaszewski'405 discloses catalysts for atom transfer radical polymerization processes. Specifically, a hybrid catalyst system comprising transition metal complexes held in close conjunction with a solid support and of a soluble ligand, or soluble transition metal complex or desorbed catalyst. The hybrid catalyst system may be used in a controlled polymerization process of radically (co)polymerizable monomers in the presence of a system comprising an initiator comprising one or more radically

transferable atom(s) or group(s). The catalyst may include a transition metal, one or more counterions, a ligand attached to a solid support, and a soluble ligand. The hybrid catalyst may also be comprised of an attached transition metal complex, and a soluble transition metal complex. The ligand or the transition metal complex may be physico- or physicochemically or chemically bound to the surface of a solid support through ionic bonding, physisorption, chemisorption, Van der Waals forces, coordinate or covalent bonding. A process for the removal and recycle of a supported transition metal catalyst complex from a polymerization reaction medium is also described (abstract). In a further option, one can add a low concentration of a reducing agent to reduce the concentration of the attached redox conjugate which would tend to increase due to unavoidable termination reactions. The reducing agent can comprise any species that reacts with a transition metal in its higher oxidation state and reduces it to a lower oxidation state and can include sources of free radicals or a transition metal in a zero oxidation state (page 5, [0052]).

Matyjaszewski'937 discloses that improved processes have been developed for atom (or group) transfer radical polymerization (ATRP). In one improvement, the ATRP process involves polymerizing in the presence of a (partially) free radical-deactivating amount of the corresponding reduced or oxidized transition metal compound. In a further improvement, the ATRP process involves polymerizing in a homogeneous system or in the presence of a solubilized initiating/catalytic system. This also concerns end-functional, site-specific functional and telechelic homopolymers and copolymers; block, random, graft, alternating and tapered (or "gradient") copolymers which may have

certain properties or a certain novel structure; star, comb and "hyperbranched" polymers and copolymers; multi-functional hyperbranched, end-functional polymers; cross-linked polymers and gels; water-soluble polymers and hydrogels (e.g., a copolymer prepared by radical copolymerization of a water-soluble monomer and a divinyl monomer); and an ATRP process using water as a medium (abstract).

However, all the above mentioned references of Matyjaszewski et al. do not disclose or fairly suggest the claimed polymerization process, wherein the reducing agent is capable of reducing the at least one transition metal catalyst from an oxidized, inactive state to a reduced, active state, and particularly wherein the oxidized reduction product does not participate as an initiator or a catalyst in control of the polymerization process, as per newly amended claims 1 and 52.

Furthermore it is noted that claim 1 encompasses a direct process to reduce that transition metal catalyst from the oxidized, inactive state to the reduced, active state and claim 52 encompasses a direct and indirect process to reduce that transition metal catalyst from the oxidized, inactive state to the reduced, active state.

5. As of the date of this Notice of Allowability, the Examiner has not located or identified any reference that can be used singularly or in combination with another references including Matyjaszewski'273, Matyjaszewski'882, Matyjaszewski'405 and Matyjaszewski'937 to render the present invention anticipated or obvious to one of ordinary skill in the art.

6. In the light of the above discussion, it is evident as to why the present claims are patentable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delay, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reason for Allowance".

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL M. BERNSHTEYN whose telephone number is (571)272-2411. The examiner can normally be reached on M-Th 8-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael M. Bernshteyn/

Application/Control Number: 10/591,426
Art Unit: 1762

Page 9

Examiner, Art Unit 1792

/M. M. B./
Examiner, Art Unit 1792